

### **ABSTRACT**

The present invention employs a mass analyzer comprised of a pair of permanent magnets to select a desired species from multiple species within a ribbon type ion beam. These permanent magnets provide a substantially uniform magnetic field of adequate magnitude in a small region not attainable with  
5 electromagnets that applies a specific force in a desired direction. The force is applied to passing particles of a ribbon ion beam and causes paths of the particles to alter according to their respective mass. As a result, a selected species can be obtained from a beam by the force causing rejected species and/or contaminants to fail passing through the mass analyzer (e.g., by impacting  
10 the magnets themselves and/or another barrier present in the analyzer). As a result of the mass analyzer, dopant/species sources that generate multiple species can be employed instead of sources that only supply a single dopant/species.